DOCUMENT RESUME

ED 079 123 SE 016 500

TITLE	Activities with Decimals, Mathematics (Experimental): 5212.75.
INSTITUTION	Dade County Public Schools, Miami, Fla.
PUB DATE	71
NOTE	13p.; An Authorized Course of Instruction for the Quinmester Program
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Algorithms; Behavioral Objectives; Curriculum; *Decimal Fractions; Instruction; Mathematics Education; *Objectives; *Secondary School Mathematics; *Teaching Guides; Tests
IDENTIFIERS	*Quinmester Program

ABSTRACT

This guidebook, which sets minimum course content, is designed for the student who has acquired basic computational skills with non-negative rational numbers. The booklet covers computation skills with decimals. General goals and performance objectives, a course outline, teaching strategies, and sample test items are included. The quin is based on chapters from the text, "Essentials of Mathematics 2", by Sobel, Maletsky and Hill. A list of six additional references is provided. (DT)

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

DADE COUNTY PUBLIC SCHOOLS

ACTIVITIES WITH DECIMALS

5212.75, 5213.75

MATHEMATICS

DIVISION OF INSTRUCTION • 1971

SE 016 500

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QUINMESTER MATHEMATICS

COURSE OF STUDY

FOR

Activities with Decimals

5212.75
5213.75

(EXPERIMENTAL)

DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida 33132
1971-72

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Published by the Dade County School Board

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PREFACE

The following course of study has been designed to set a minimum standard for student performance after exposure to the material dsscribed and to specify sources which can be the basis for the planning of daily activities by the teacher. There has been no attempt to prescribe teaching strategies; those strategies listed are merely suggestions which have proved successful at some time for some class.

The course sequence is suggested as a guide; an individual teacher should feel free to rearrange the sequence whenever other alternatives seem more desirable. Since the course content represents a minimum, a teacher should feel free to add to the content specified.

Any comments and/or suggestions which will help to improve the existing curriculum will be appreciated. Please direct your remarks to the Consultant for Mathematics.

All courses of study have been edited by a subcommittee of the Mathematics Advisory Committee.

CATALOGUE DESCRIPTION

A course which will develop computational skills with non-negative rational numbers through activities that promote interest. Emphasis is on decimals.

Designed for the student who has acquired basic computational skills with non-negative rational numbers.

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GOALS

1. To further develop **computation skills with decimals.**

2. To maintain **computation skills with fractions, whole numbers,** and percents.

3. To develop a positive attitude toward mathematics.

4. To develop problem-solving skills.

OVERALL STRATEGIES

1. This quin is based on the state-adopted text, Essentials of Mathematics, 2 by Sobel, Maletsky and Hill. Chapters 5, 8, and 9 constitute the core of this course.

2. Do not cover more than chapters 5, 8, and 9 of the text as the remaining chapters are covered in other quins.

3. A pre-test should be administered to determine the ability of the students to work with decimals. All deficiencies should be noted, and activities should be planned to help each student overcome his particular deficiencies and develop additional skills.

4. Although some of the skills work can be done with the class as a whole, there should be individual prescriptions made for those students who do not master the skills during regular classroom instruction.

5. Performance objectives are listed only for computational skills. The performance in other areas is left to the teacher's discretion, depending on the ability level of the students he is teaching.

6. The skills work will need to be supplemented. This can be done with work from any basic text, by using any of the resources listed at the end of the quin, or by use of ditto material.

7. It is suggested that all of the activities in the text be used to help motivate the students.

PERFORMANCE OBJECTIVES FOR SKILLS

These objectives represent the minimum expectations for student performances at the end of a nine-week period.

The student will:

1. Write the decimal numeral of 5 places or less that is equivalent to a given verbal expression.
2. Write the verbal expression for a given decimal of not more than 5 places.
3. Round a decimal numeral to a given place value.
4. Compare any two decimals.
5. Add any two or more decimals.
6. Find the positive difference of any two decimals.
7. Multiply any two decimals.
8. Divide any decimal by any decimal of three digits or less.
9. Determine the decimal that is equivalent to a given fraction.
10. Multiply or divide a decimal by any power of ten.
11. Estimate the answers to problems involving decimals.
12. Solve verbal problems involving operations with decimals.

COURSE OUTLINE

I. **Skills --Decimals**

A. Meaning
   1. Numbers to words
   2. Words to numbers
   3. Rounding
   4. Comparing

B. Computation
   1. Addition
   2. Subtraction
   3. Multiplication
   4. Division
   5. Decimal equivalent of a fraction
   6. Multiply and divide by powers of ten

C. Problem-solving
   1. Estimating solutions
   2. Exact solutions

II. **Other Topics**

A. Congruence

B. Angles
   1. Measuring
   2. Types

C. Triangles
   1. Sum of angles
   2. Types
   3. Pythagorean theorem

D. Geometric drawing
   1. Sketching
   2. Construction
   3. Designs

STRATEGIES

1. A set of cards, each containing a single digit and one containing a decimal point, can be very useful in developing the concept of place value. Form various numerals with the cards by resting them in a ledge, and ask students to identify the place value of selected digits.

2. When reading and writing decimals, give students examples and have them do exercises orally, stressing pairs like .326 and 300.026. Emphasize that the word "and" is only used in place of a decimal point between the whole number part and the decimal part of the number.

3. Show that rounding off is essential in problems involving money: the quantity $32.4689 does not make sense since the smallest unit of American money is $.01. Also, use measurement to show the need for rounding answers. Show that decimals are more effective than fractions for expressing approximate numbers because they show the degree of accuracy. ($\frac{1}{2}$ does not give as much information as .5, .50, .500, etc.)

4. When adding decimals, ask students what they would get as an answer in adding 3 feet to 2 pounds, or 6 bananas to 5 grapefruit. Show that this is similar to trying to add units to tenths, etc. This is a good time to drill the principle that only LIKE TERMS can be added.

5. In developing multiplication of decimals, show students examples using the fraction equivalents of decimal numbers.

6. In developing division of decimals, remind students that both numerator and denominator of a fraction can be multiplied by the same number without changing the value of the fraction. Show that this is the same as multiplying both divisor and dividend by the same number in a long division problem.

SAMPLE TEST ITEMS FOR SKILLS

(Keyed to the Objectives)

The skills tested represent a minimum for the 9-week course.

1. Write the decimal numeral for each verbal expression.
   a. Ten and two hundred fifty ten-thousandths
   b. One thousand, six hundred four hundred thousandths

2. Write the verbal expression for each decimal numeral.
   a. 6.3275 b. 0.04028

3. a. Round 8.84397 to thousandths.
   b. Round .90578 to ten thousandths.

4. Which decimal in each pair is larger?
   a. .007325; .02634 b. .11265; .1129

5. Add:
   a. 62.39
8.75
+3.21 b. 2.728 + 10.28 + 9 + 93.057

6. Subtract:
   a. 2607.93
- 28.78 b. 407.382 - 27.86 c. 15 - 7.347

7. Multiply:
   a. 23.7
x.04 b. .627
x.014 c. 8.37
x5.9

8. Divide:
   a. $2.6\overline{).0884}$ b. .8901 ÷ 4.3

9. Write the decimal equivalent for each fraction.
   a. $\frac{5}{8}$ b. $\frac{2}{9}$ c. $\frac{7}{5}$

10. Perform the indicated operations.
    a. 5.6 x 100 b. 69.37 ÷ 1000 c. $87 \div 10^4$ d. 9.7348×10^3

11. Choose the best estimate of the answer for each problem.
    a. What is the cost of 7 air conditioners, if the cost of each is $279.95?
       1. $300 2. $2100 3. $1000 4. $3000
    b. How many .38 inch wide aluminum strips can be cut from an aluminum sheet 3.5 inches wide?
       1. .9 2. 1 3. 3 4. 9

12. Solve each problem.
    a. If grapes are $.24 a pound, what is the cost of 6 pounds of grapes?
    b. A car travels 218.7 miles on 13.5 gallons of gasoline. How many miles per gallon does the car average?

ANSWER KEY

1. a. 10.0250 b. .01604

2. a. Six and three thousand two hundred seventy-five ten-thousandths
   b. Four thousand twenty-eight hundred-thousandths

3. a. 8.844 b. .9058

4. a. .02634 b. .1129

5. a. 74.35 b. 115.065

6. a. 2579.15 b. 379.522 c. 7.653

7. a. .948 b. .008778 c. 49.383

8. a. .034 b. .207

9. a. .625 b. $.2\overline{2}$ c. 1.4

10. a. 560 b. .06937 c. .0087 d. 9734.8

11. a. 2. $2100 b. 4. 9

12. a. $1.44 b. 16.2 miles/gallon

RESOURCES

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